

Klamath National Forest

Best Management Practices

**REGION 5
EVALUATION PROGRAM
WATER QUALITY
MONITORING REPORT**

Evaluation of
Forest Service Administered Projects
Including, Timber Sales, Roads,
Prescribed Fire, Mining Activities
and Revegetation Activities During
1999

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BEST MANAGEMENT PRACTICES (BMP) EXECUTIVE SUMMARY 1999

This year (1999) represents the eighth year of the Best Management Practices Evaluation Program (BMPEP) on the Klamath National Forest. This program is designed to evaluate the effects of Forest land management practices and activities on water quality. On site evaluations have been divided into 28 categories that reflect timber, engineering, recreation, grazing, fire, mining, and vegetative activities and programs.

In 1999, 38 projects or sites were drawn at random from Forest activity pools based upon Regional activity assignments. Each project or site was reviewed for BMP implementation and effectiveness. The category and types of projects monitored were: timber (16 sites), roads (10 sites), recreation (2 sites), grazing (1 site), fire (6 sites), mining (1 site), and tractor piling (2 sites). Monitored activities occurred on Happy Camp, Salmon River, Scott River (including the Oak Knoll area), and Goosenest Districts

Evaluation of BMP Implementation compliance involved (1) doing what we said we were going to do to protect water quality and (2) determining project document sufficiency regarding watershed objectives. BMP Effectiveness compliance involved determining if water quality protection measures were effective in meeting management objectives. The table below summarizes the results of the BMP Evaluation Program for 1999, as well as for previous years.

Monitoring Years	Total # Sites Monitored	Sites Meeting BMP Monitoring Criteria			
		Implementation		Effectiveness	
		# of Sites	% of Total Successful	# of Sites	% of Total Successful
1992	53	29	55%	43	81%
1993	77	61	79%	72	94%
1994	52	39	75%	46	89%
1995	77	64	83%	74	96%
1996	57	48	84%	56	98%
1997	60	60	100%	59	98%
1998	61	38	62%	30/35	86%
1999	38	25	66%	34	89%

Implementation standards for BMPs were fully compliant on 66% of the sites evaluated. BMP effectiveness requirements were met on 89% of the sites evaluated. Three sites reported sediment reaching intermittent or perennial channels with one site probably having a measurable amount of sediment entering the North Fork of Dillon Creek but not enough to impair water quality. One site had possible human waste contamination entering Butte Creek. Basically, there was no evidence of significant water quality impairment from the 4 noncompliant sites. This represents a slight improvement in BMP implementation and effectiveness compared to 1998. Areas in need of improved BMP implementation are prescribed fire (all types), tractor piling, snow removal and mining operations.

Areas in need of improved BMP effectiveness are snow removal operations, prescribed fire (broadcast burns) and developed recreation sites.

BMP MONITORING REPORT

INTRODUCTION

On site evaluations are the core of the BMP Evaluation Program. There are 28 different evaluation procedures with each one designed to assess a specific practice or set of closely related practices. Evaluation procedures vary greatly based upon the management activity evaluated, but the overall evaluation process is similar. The type and number of management activities evaluated each year on the Forest are assigned by the Regional Office. The specific management activity sites evaluated are randomly selected from project pools. The criteria for sample pool development has been standardized by the Region for each activity type and are described in the BMP User's Guide (1999).

One of the goals of BMP monitoring is to strive for interdisciplinary evaluation of projects including the project proponents and watershed personnel. This gives direct feedback to the project proponent on how well the BMP was implemented and provides for adaptive management if necessary on future project development.

No concurrent BMP monitoring is included in this report.

SAMPLING

Data collection methods are specific for each BMP and are described in the 1999 BMP User's Guide. BMP evaluations that require monitoring soil cover use the Forest's soil cover monitoring procedures developed by the Forest in 1998. The types of data gathered is identified for each BMP and is used to answer specific evaluation questions on each BMP evaluation form. Management activities, such as timber projects, roads, prescribed fire, tractor piling require: 1) a prepared EA or EIS; 2) all contract requirements met; and 3) at last one winter (but not more than 3 winters) has passed since contract requirements have been met.

The timber and roads project sample pool was developed from a list of closed timber sales. The prescribed fire sample pool was developed from a list of completed burn projects. The recreation sample pool was the list of all known developed sites on the Forest. The range sample pool was a list of active grazing allotments on the Forest by district. The mining sample pool was a list of active placer mine operations on the Forest.

BMP evaluations were coordinated by Tom Laurent, Sharon Koorda, Robbie Van de Water (with District assistance), Polly Haessig (with District assistance), Mark Reichert and Jim Stout.

SUMMARY BY PROJECT TYPE

T01 Streamside Management Zones

Two harvest units were reviewed from two different timber sales (Bullion TS and Specimen TS) on Oak Knoll and Salmon River Districts. The SMZ in harvest unit 26 (Bullion TS) used a standard SMZ width (1 site tree height) and was not marked on the ground. The harvest unit used an ITM mark outside of the SMZ. The SMZ was a no cut and no disturbance SMZ. This SMZ met all evaluation requirements for BMP implementation and effectiveness.

The SMZ in harvest unit 52 (Specimen TS) was burned in a wildfire. Selected fire killed trees were harvested within the SMZ. The area within the SMZ had 86% total soil cover. Activity created fuels were hand piled in the SMZ. This SMZ met all evaluation requirements for BMP implementation and effectiveness.

T02 Skid Trails

Five skid trails were evaluated from three timber sales (Bullion, Deep Creek Blowdown, 1st Insect Salvage) on Oak Knoll, Scott River and Goosenest Ranger Districts. The five randomly selected skid trails met all evaluation criteria for BMP implementation and effectiveness requirements. The following table shows the skid trail data collected and used for BMP evaluation.

Table 1. Skid trail data.

District	Project Name	Unit Number	Area in Skid Trails	Area of Rills/Ruts	Number of WB Failed	Waterbar Failure Rate
			----- % -----			--- % ---
OK	Bullion	1	17	11	0	0
		5	20	10	1	9
GN	1st Insect	1	25	0	1	20
		1	33	0	0	0
SCT	Deep Ck	1	10	4	0	0

Note: WB-waterbar

Table 1 shows that only one harvest unit met the 15% BMP evaluation guideline for the percent of area in skid trails. Not meeting this evaluation guideline did not influence the overall rating in meeting the evaluation criteria for this BMP based upon the database scoring system.

T03 Suspended Yarding

Three harvest units from the Specimen Timber Sale (Salmon River) were evaluated. Two harvest units had suspended yarding through a wildfire burned SMZ. These three harvest units met all evaluation criteria for implementation and effectiveness. Soil cover within these SMZs varied from 86 to 91%. There was no visible ground disturbance within the SMZ from yarding activities.

T04 Landings

Six timber sale landings were reviewed from the Specimen TS (1 landing), First Insect Salvage TS (2 landings), Bullion TS (2 landings) and Deep Creek Blowdown TS (1 landing) on Salmon River, Goosenest, Oak Knoll and Scott River Districts.

Two landings had significant fillslope rilling which was due to not controlling landing and road created runoff. Water quality was not affected by rilling of these two landing fillslopes.

All six landings met BMP implementation and effectiveness requirements

E08 Road Surface, Drainage and Slope Protection

Four road maintenance and reconstruction projects from Specimen TS (roads 40N42 and 40N42D) and First Insect Salvage TS (road 44N27) on Salmon River and Goosenest Districts were reviewed. Three of the four projects met BMP implementation requirements. The project that did not meet implementation requirements was the result of using poorly constructed water bars. Forty percent of the water bars were not properly functioning. Sale administrator Jon Bennett indicated that this outsloped road segment was in a self maintaining design prior to the installation of water bars. Jon indicated that the water bars were not necessary but were installed by the purchaser anyway.

The four projects met all BMP effectiveness requirements in that water quality was not impaired.

E09 Stream Crossing

One road stream crossing was evaluated associated with a placer mining operation on the Salmon River District. This crossing met all evaluation criteria for proper BMP implementation and effectiveness.

E14 Temporary Road

One temporary road (40N42D) was evaluated in the Specimen TS on the Salmon River District. This road, while mentioned in the EA, was not shown on the sale area map. The EA required this road to be put into a self maintaining condition for surface drainage (no culverts used). Very shallow water bars were used to disperse runoff along this road. Forty percent of the water bars were not functioning

properly after three years. There was also a small amount of down cutting on the fillslope side of an intermittent stream crossing (no culvert) where water flows across the road prism.

Overall, this road met all evaluation requirements for implementation and effectiveness in that water quality was not impaired.

E16 Water Source

Two existing water sources were evaluated, one each on the Scott River and Salmon River Districts. Both sites met all evaluation requirements for meeting BMP implementation and effectiveness criteria.

E17 Snow Removal

Segments of 2 roads (46N53 and 40S16) were monitored during snow removal activities. BMP requirements were properly implemented on only one (46N53) of the two evaluated road segments. Implementation failure on road 40S16 was due to the plow blade set too low which allowed the removal of roadway surface rock or native materials on 10-20% of the monitored road segment. All BMP effectiveness criteria were met on both of the monitored road segments.

R22 Developed Recreation Sites

Two developed recreation sites, Green Riffle River Access (Ukonom) and Shafter Campground (Goosenest) were evaluated for BMP compliance.

Green Riffle River Access met BMP implementation requirements but failed to meet BMP effectiveness requirements. The main reason for not meeting BMP effectiveness was due to evidence of sediment delivery to the Klamath River. This site was damaged in the 1997 flood and was recently reconstructed.

Shafter Campground failed to meet BMP implementation and effectiveness requirements. Implementation failed due to the campground not meeting current Forest Service standards and guidelines and using outdated sanitation facilities that were located within 100 feet of a water body. The sanitation facilities currently do not meet Forest Service Manual 2330 design standards.

G24 Range Management

This BMP is currently being revised and the results of this years monitoring should be considered as informal. This evaluation was made using the old evaluation criteria.

One grazing allotment was reviewed on the Goosenest Ranger District. This allotment (Dry Lake) failed the evaluation requirements for implementation but met BMP effectiveness requirements. This allotment failed implementation due to the allotment operating under an old Range EA from 1965 and that stock counts had not been conducted.

F25 Prescribed Fire

Six prescribed fire units were monitored on Happy Camp, Scott River and Goosenest Ranger Districts.

Three in-season broadcast burn units were evaluated from the Outside Timber Sale. These units were burned in 1998. These three units did not meet BMP implementation because: 1) The Burn Plan did not identify soil cover requirements as identified in the EA document; and 2) The units failed to meet first year soil cover objectives.

Two of these in-season burned units did not meet BMP effectiveness requirements because insufficient cover was retained and evidence of significant sediment transport to the channel was observed. Soil cover varied from 36 to 41 percent. The soil cover objective was 50% for these units.

Three underburn units (Bluejay, Mud Lake and Sharps) on Scott River and Goosenest Ranger Districts were evaluated. All three underburn units failed to meet BMP implementation requirements because there was no mention of soil cover objectives in the Burn Plans. One Burn Plan described the soil cover objective as *"Retain duff layers as appropriate"*. This is not a proper soil cover objective. Failure to identify soil cover objectives in Burn Plans automatically fails BMP implementation, regardless of the amount of post-burn soil cover retained. All three burns met BMP effectiveness requirements. Measured soil cover was 79 to 90 percent. The LRMP soil cover objective was 50% for Bluejay and 60% for Mud Lake and Sharps.

M26 Mining Operations

The Yellow Cat Mine, a placer operation on the Salmon River District, was reviewed. This operation did not meet BMP implementation requirements due to not implementing hazardous materials protective measures.

This operation met BMP effectiveness evaluation requirements in that water quality was not impaired.

V28 Vegetation Manipulation

Two tractor pile units were monitored from the Lick Timber Sale on the Scott River Ranger District. These units were piled in 1998. These two units failed to meet BMP implementation requirements because: 1) The EA for this project did not mention soil cover objectives; and 2) First year soil cover objectives (70%) were not met.

Both units met BMP effectiveness requirements. Measured soil cover was 62 to 64 percent. The soil cover objective was 70% as identified in the LRMP. Both units failed to meet this cover objective. One unit, at 64% cover, was within 90% of the cover objective and the other unit, at 62% cover, was less than 90% of the cover objective. No rill erosion was observed. These units met the effectiveness requirements because eroded soil material (as sheet erosion) did not reach any stream channel and water quality was not impaired.

SUMMARY

Overall, 66% of the BMP evaluated sites met all implementation requirements. This is a slight improvement over the 1998 rate. This implementation rate can be easily improved by inclusion of soil cover and water quality objectives in Burn Plans and environmental documents.

BMP effectiveness requirements were met on 89% of the sites monitored. Three sites reported sediment reaching intermittent or perennial channels with one site probably having a measurable amount of sediment entering the North Fork of Dillon Creek but not enough to impair water quality. One site had possible human waste contamination entering Butte Creek. Basically, there was no evidence of significant water quality impairment from the 4 noncompliant sites.

Table 2. Summary of BMP Implementation and Effectiveness Success Rate.

BMP	Total # of Sites	Implementation		Effectiveness	
		# of Sites Meeting Criteria	% of Total	# of Sites Meeting Criteria	% of Total
T01	2	2	100	2	100
T02	5	5	100	5	100
T03	3	3	100	3	100
T04	6	6	100	6	100
E08	4	3	75	4	100
E09	1	1	100	1	100
E14	1	1	100	1	100
E16	2	2	100	2	100
E17	2	1	50	0	0
R22	2	1	50	0	0
G24	1	0	0	1	100
F25	6	0	0	4	67
M26	1	0	0	1	100
V28	2	0	0	2	100

Areas in need of improved BMP implementation:

- snow removal (50% passing)
- prescribed fire (0% passing)
- tractor piling (0% passing)
- mining (0% passing)

Most of these problems can be solved by inclusion of BMP objectives in project documentation.

Areas in need of improved BMP effectiveness:

- developed recreation sites (0% passing)
- prescribed fire (67% passing)

PROBLEMS, EFFECTS AND MANAGEMENT RECOMMENDATIONS

A. Problem: Poor BMP implementation

BMP implementation evaluation protocols require that burn plans and environmental analysis documents describe water quality protection measures. This will involve: 1) Identification of activity applicable BMPs during project planning phase; 2) specific actions or protection mitigations necessary to meet applicable BMPs during project implementation; and 3) Identification of applicable concurrent monitoring necessary to meet LRMP Standards and Guidelines or ESA Terms and Conditions. Failure to identify these measures or objectives automatically fails BMP implementation when the information is entered into the Regional BMP database. The BMP evaluation protocol is specifically designed in this manner because it's assumed that a project leader can not properly implement BMPs if they do not know what is required. Successful BMP implementation should be by design not luck.

Identifying the soil cover objective is a very simple task. Table 4-2 (page 4-21) in the Forest's LRMP clearly identifies current soil cover requirements for lands disturbed by prescribed fire and tractor pile projects.

Management Recommendation

1. A BMP crosswalk between each BMP and its evaluation protocol will be distributed to each District for distribution to the appropriate staff groups. This will help users to identify the requirements needed to meet BMP implementation. Interdisciplinary involvement of soil scientist and hydrologist at the project design stage can also identify project requirements to meet BMPs. This will be accomplished by the end of March 2000.
2. A short refresher orientation presentation (30 minutes) can be given to Fuels Management specialists on how to meet BMP implementation requirements their next Forest-wide meeting for BMPs 6.3 and 5.1, 5.2, 5.5 and 5.7. This recommendation was accomplished on March 1, 2000.
3. A refresher course will be given to recreation officers and recreation technicians on how to conduct BMP evaluations and analyze recreation sites for compliance with recreation BMPs (4.4, 4.5, 4.6, 4.9, 4.10, 4.11). This recommendation was accomplished on January 11, 2000.

B. Problem: Snow removal scraping off part of the road bed

Over the past 8 years (1992-1999), snow removal activities have had varying degrees of success. BMP implementation failure rates have varied from 40 to 80% for four out of the last 8 years. It appears that the dozer operator or operators are not consistently applying the Forest's snow removal standards and guidelines.

Management Recommendation

It's recommended that a refresher orientation regarding snow removal BMP and Standard and Guides be conducted and include: 1) silvicultural personnel administering snow removal contracts; 2) district dozer operators; and 3) forest road crews. In addition, the BMP field coordinator for this BMP will visit all sites during snow removal operations.

C. Problem: Hazardous material management at mine operations

Secondary containment of stored hazardous materials (fuel and hydraulic fluids) was not properly implemented on site in 1999. The mine operation plan and the Forest Service specified that fuel will be stored in lined containment facilities located outside of the flood plain. Some of the fuel containers were sitting directly on the ground and some were on a tarp, but there was no secondary walled containment.

Management Recommendations

The Forest Service should provide clear examples of what secondary containment means in the Plan of Operations and in its terms and conditions documents to the mine operator. Examples of secondary containment include: a) a shallow pit with an impermeable lining; or b) a commercially available containment systems that are portable, easy to use and set up. Commercial containment systems can be found at www.newpig.com. Administrative site reviews by Forest Service personnel should closely monitor hazardous materials storage during mine operations.